Chapter 4. Data Products

At its simplest, a *data product* consists of a PDS label and the data object that it describes. More complex data products may contain several mutually dependent data objects, a primary object and one or more secondary objects, or both. In all cases, a single label is used to describe all parts of the product (even if they are held in separate physical files). A single PRODUCT_ID value is defined for the entire set in that PDS label.

A data product is one component of a *data set* (see the *Data Set/Data Set Collection Contents and Naming* chapter of this document).

Primary Data Object

A primary data object is a set of results from a scientific observation. Primary data objects are usually described using one of these PDS object structures:

TABLE
IMAGE
SERIES
SPECTRUM

Secondary Data Object

A secondary data object is any data used for processing or interpreting the primary data object(s), for example, a histogram derived from an image. Secondary data objects are usually described using one of these PDS object structures:

HISTOGRAM
PALETTE
HEADER

The PDS data product label, written in Object Description Language (ODL) (see the *Object Description Language (ODL) Specification and Usage* chapter of this document), defines both the physical and logical structure of the constituent data object(s).

4.1 Data Product File Configurations

The PDS label and data object may be in the same file or separate files. For data products with more than one object, the data objects may be in one or more files. In all cases, however, there must be exactly one PDS label containing exactly one PRODUCT_ID value. The PRODUCT_ID value must be unique within the data set containing this data product.

Example

Consider a data product that consists of a 3-color image in which each color plane is stored in a separate physical file (that is, one file each for red, blue and green). Since all three colors are required to get the full image, this product contains three mutually dependent primary objects.

The label for this data product will contain a single PRODUCT_ID, three pointers to the separate data files, and three IMAGE object definitions. To aid in distinguishing between data files, the data preparer may also choose to include an IMAGE_ID keyword in each IMAGE object definition. The resulting PDS label would contain the following lines:

```
PRODUCT_ID          = "22A190"
…
^RED_IMAGE          = "22A190R.IMG"
^GREEN_IMAGE        = "22A190G.IMG"
^BLUE_IMAGE         = "22A190B.IMG"
…
OBJECT              = RED_IMAGE
   IMAGE_ID         = "22A190-RED"
   …
END_OBJECT          = RED_IMAGE

OBJECT              = GREEN_IMAGE
   IMAGE_ID         = "22A190-GREEN"
   …
END_OBJECT          = GREEN_IMAGE

OBJECT              = BLUE_IMAGE
   IMAGE_ID         = "22A190-BLUE"
   …
END_OBJECT          = BLUE_IMAGE
```

Figure 4.1 illustrates file configurations for a data product with a single data object.

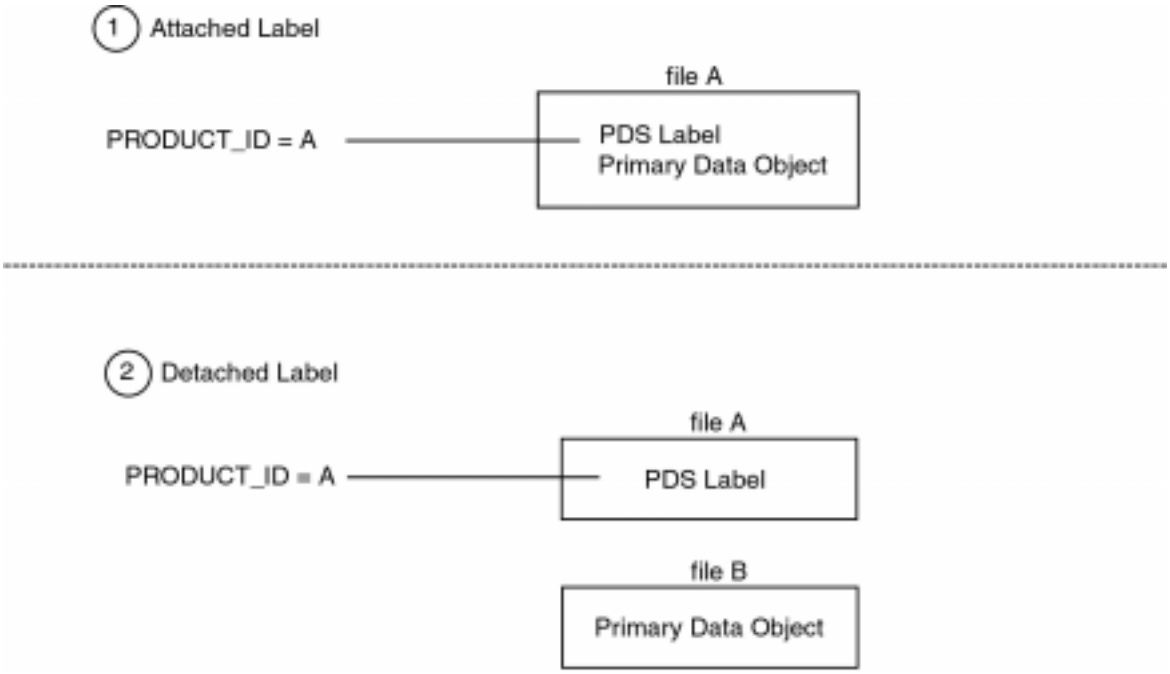

Figure 4.1 Data Product with a Single Data Object

Figure 4.2 shows possible file configurations for a single data product consisting of two data objects, a primary and secondary data object. Similar examples could be made using data products composed of several primary data objects.

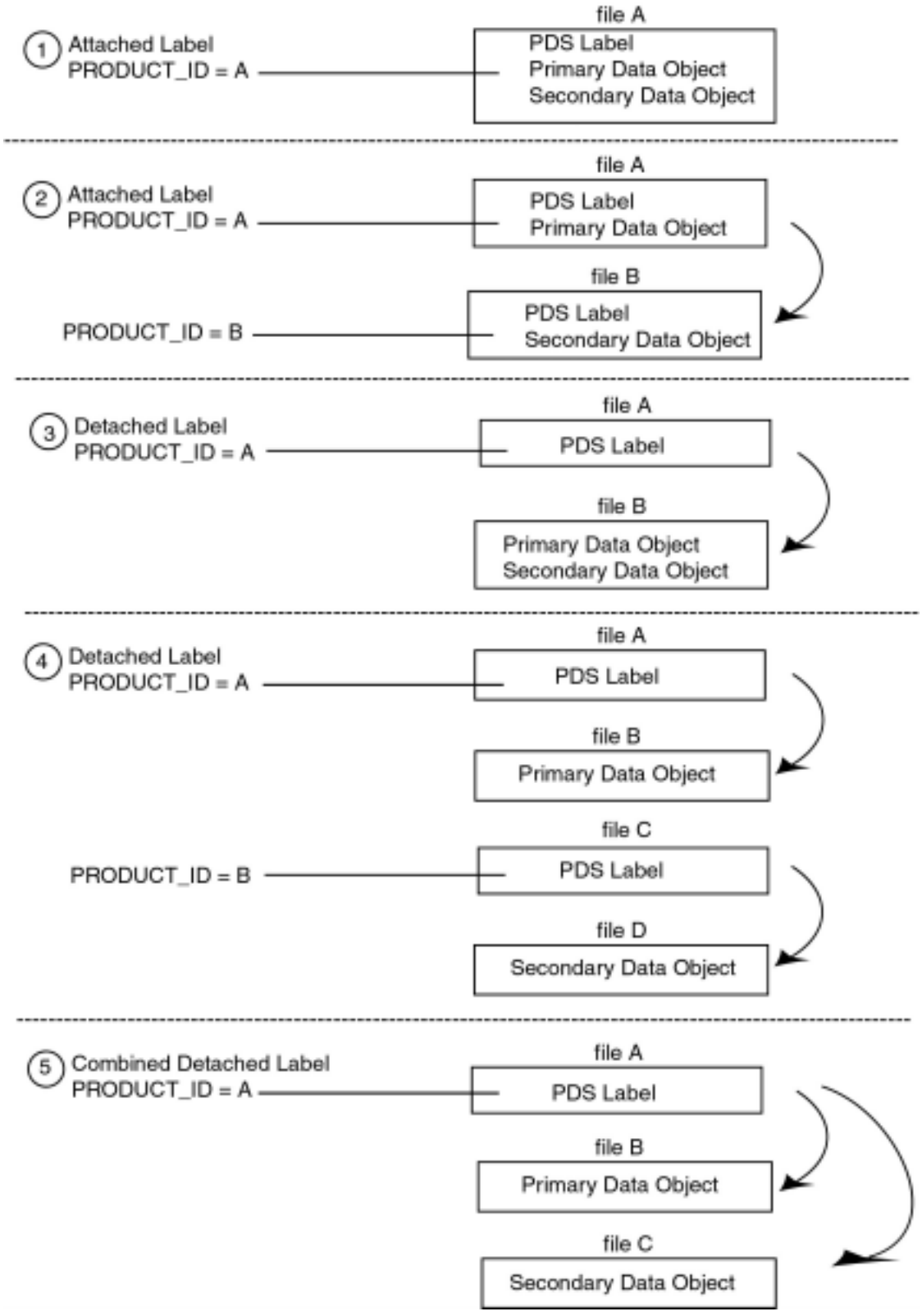

Figure 4-2. Data Product with Multiple Data Objects